

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 12 OCT 2005

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Applicant's or agent's file reference 0000053704		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/EP2004/007256		International filing date (day/month/year) 03.07.2004	Priority date (day/month/year) 23.07.2003	
International Patent Classification (IPC) or national classification and IPC A62D1/00				
Applicant BASF AKTIENGESELLSCHAFT				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input checked="" type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 22.04.2005		Date of completion of this report 11.10.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer  Wengeler, H  Telephone No. +31 70 340-1936		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/007256

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-20 as originally filed

**Claims, Numbers**

1-15 received on 12.09.2005 with letter of 12.09.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/007256

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**Box No. II Priority**

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1. ☒ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:  
☒ copy of the earlier application whose priority has been claimed (Rule 66.7(a)).  
☐ translation of the earlier application whose priority has been claimed (Rule 66.7(b)).
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1). Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-15
	No: Claims	
Inventive step (IS)	Yes: Claims	1-15
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/EP2004/007256

**Re Item V.**

- 1 The following documents are referred to in this communication:
- D1 : US 3 354 084 A (KATZER MELVIN F) 21 November 1967 (1967-11-21)
  - D2 : DATABASE WPI  
Derwent Publications Ltd., London, GB; Class A97, AN 1981-84248  
XP002297922 & JP 56 125066 A (OTSUKA KAGAKU  
YAKUHIIN) 1 October 1981 (1981-10-01)
  - D3 : US 2002/189492 A1 (VANDERSALL HOWARD L ET AL) 19 December 2002  
(2002-12-19)
  - D4 : EP 0 911 067 A (CHEMONICS FIRE TROL INC) 28 April 1999 (1999-04-28)
  - D5 : US-A-5 849 210
  - D6 : US-A-5 190 110

1. Novelty , Art. 33(2) PCT.

D1 (claim 5) refers to a composition comprising water, 0,05-2 wt.% of a water swellable acrylic polymer, 0,1-2 pts.wt. of a non-ionic solid which is titanium oxide (claim 2) and 0,01-0,3 pts.wt of a dye. The water swellable acrylic copolymers can be used "to thicken water used in fighting fires" (col. 1. l. 14-19).

Document D2 describes an aqueous solution of 2-3 wt% polyacrylic acid or polyacrylamide, water, ammonium phosphate and 0,01-0,03 wt% colorant.

The subject-matter of claims 1-15 is distinguished from the closest prior art D1-D2 in that it refers to specific opacifying agents.

2. Inventive step, Art. 33(3) PCT

There was no suggestion in the prior art to select the specific opacifying agents. These compositions are not derivable from any of D1-D6 whether read individually or in any combination.

Hence, an inventive step can be recognized for these claims.

## WHAT IS CLAIMED IS:

1. A method of controlling a fire consuming a combustible object comprising a step of applying a sufficient amount of a fire-fighting composition to the combustible object to retard, suppress, or extinguish the fire, said fire-fighting composition comprising:
  - (a) 0.01% to 20%, by weight, of a superabsorbent polymer;
  - (b) 0.005% to 10%, by weight, of a colorant;
  - (c) 0.005% to 10%, by weight, of an additional opacifying agent selected from the group consisting of an inorganic compound having a water solubility, in its anhydrous form of 0.0005 to 0.005 grams per 100 ml of water at 25°C, a synthetic organic homopolymer or copolymer, and mixtures thereof; and
  - (d) water.
2. A method of preventing a fire from consuming a combustible object comprising a step of applying a sufficient amount of a fire-fighting composition to the combustible object to inhibit initiation of the fire, said fire fighting composition comprising:
  - (a) 0.01% to 20%, by weight, of a superabsorbent polymer;
  - (b) 0.005% to 10%, by weight, of a colorant;
  - (c) 0.005% to 10%, by weight, of an additional opacifying agent selected from the group consisting of an inorganic compound having a water solubility, in its anhydrous form of 0.0005 to 0.005 grams per 100 ml of water at 25°C, a synthetic organic homopolymer or copolymer, and mixtures thereof; and
  - (d) water.
3. The method of claim 1 or 2 wherein the colorant and the opacifying agent are present in a weight ratio of 1 part colorant to about 0.25 to about 5 parts opacifying agent.
4. The method of one of the claims 1 to 3 wherein the opacifying agent and superabsorbent polymer are present in a weight ratio of 1 part opacifying agent to 1.5 to 10 parts superabsorbent polymer.
5. The method of one of the claims 1 to 4 wherein the fire is a forest fire, a grass fire, a brush fire, or a wildfire.
6. The method of one of the claims 1 to 5 wherein the combustible objects comprises a man-made structure.

7. The method of one of the claims 1 to 6 wherein the superabsorbent polymer is present in an amount of 0.05% to 10%, by weight of the composition.
- 5 8. The method of one of the claims 1 to 7 wherein the superabsorbent polymer comprises a polymerized  $\alpha,\beta$ -unsaturated carboxylic acid, or a salt or an anhydride thereof.
- 10 9. The method of one of the claims 1 to 8 wherein the superabsorbent polymer is selected from the group consisting of poly(acrylic acid), a hydrolyzed starch-acrylonitrile graft copolymer, a starch-acrylic acid graft copolymer, a saponified vinyl acetate-acrylic ester copolymer, a hydrolyzed acrylonitrile copolymer, a hydrolyzed acrylamide copolymer, an ethylene-maleic anhydride copolymer, an isobutylene-maleic anhydride copolymer, a poly(vinylsulfonic acid), a poly(vinylphosphonic acid), a poly(vinylphosphoric acid), a poly(vinylsulfuric acid), a sulfonated polystyrene, and salts and mixtures thereof.
- 15 10. The method of the claims 1 to 9 wherein the superabsorbent polymer is selected from the group consisting of a poly(vinylamine), a poly(dialkylaminoalkyl (meth)acrylamide), a polyethylenimine, a poly(allylamine), a poly(allylguanidine), a poly(dimethyldiallylammonium hydroxide), a quaternized polystyrene derivative, a guanidine-modified polystyrene, a quaternized poly((meth) acrylamide) or ester analog, a poly(vinylguanidine), salts thereof, and mixtures thereof.
- 20 11. The method of one of the claims 1 to 10 wherein the superabsorbent polymer comprises polyacrylic acid neutralized 50% to 100%.
- 25 12. The method of one of the claims 9 to 11 wherein the polyacrylic acid is neutralized with sodium hydroxide, sodium carbonate, potassium hydroxide, potassium carbonate, or a mixture thereof.
- 30 13. The method of one of the claims 1 to 12 wherein the colorant is present in an amount of 0.01% to 5%, by weight of the composition.
- 35 14. The method of one of the claims 1 to 13 wherein the colorant is a dye, a pigment, or a mixture thereof.
15. The method of one of the claims 1 to 14 wherein the colorant imparts a yellow, red, orange, violet, or blue color to the composition.
- 40 16. The method of one of the claims 1 to 15 wherein the colorant is selected from the group consisting of a direct dye, a basic dye, an acid dye, a reactive dye, a solvent dye, a disperse dye, a leather dye, a natural dye, a sulfur dye, a vat dye, a

synthetic pigment, a naturally occurring pigment, a security dye, and mixtures thereof.

17. The method of claim 16 wherein the colorant comprises a direct dye.
18. The method of claim 17 wherein the direct dye is selected from the group consisting of Direct Red 81, Direct Red 239, Direct Red 254, Direct Yellow 11, Direct Yellow 6, Direct Yellow 127, Direct Orange 102, Direct Orange 102:1, Direct Orange 116, Direct Yellow 5, and mixtures thereof.
19. The method of the claims 17 or 18 wherein the colorant comprises Red 51L, Orange 80LN, or Yellow 76LN.
20. The method of one of the claims 1 to 19 wherein the opacifying agent is present in an amount of 0.01% to 5%, by weight of the compositions.
21. The method of one of the claims 1 to 20 wherein the opacifying agent is selected from the group consisting of calcium carbonate, a styrene-butadiene copolymer, a styrene-vinylpyrrolidone copolymer, a styrene-butadiene-acrylonitrile copolymer, an acrylic polymer, a polyvinyl acetate, a polyvinyl acrylate, a starch, a polyethylenimine, a polystyrene, a polyethylene, a polyvinyl alcohol, and mixtures thereof.
22. The method of one of the claims 1 to 21 wherein the opacifying agent comprises calcium carbonate.
23. The method of one of the claims 1 to 22 wherein the opacifying agent comprises an emulsion or a latex of the synthetic homopolymer or copolymer.
24. The method of claim 23 wherein the opacifying agent comprises a polyethylenimine.
25. The method of one of the claims 1 to 24 wherein the composition further comprises up to 10%, by weight, of a water soluble organic solvent.
26. The method of one of the claims 1 to 25 wherein the composition further comprises one or more optional ingredient selected from the group consisting of a viscosity modifier, a dispersant, a pH modifier, a surfactant, and mixtures thereof.
27. The method of one of the claims 1 to 26 wherein the composition imparts a color to the combustible object.

28. The method of claim 27 wherein the color imparted to the combustible object substantially fades within 30 days after application of the composition.
- 5 29. The method of claim 27 or 28 wherein the color imparted to the combustible object is of sufficient intensity such that a combustible object having the composition applied thereto is differentiated from the combustible object that lacks an application of the composition by a naked eye.
- 10 30. The method of one of the claims 1 to 29 wherein the composition is applied by ground equipment or by aerial equipment.
31. A composition comprising
- 15 (a) 0.1% to 5%, by weight, of a superabsorbent polymer;
- (b) 0.015% to 2%, by weight, of a colorant;
- (c) 0.015% to 2%, by weight, of an additional opacifying agent selected from the group consisting of an inorganic compound having a water solubility, in its anhydrous form of 0.0005 to 0.005 grams per 100 ml of water at 25°C., a synthetic organic homopolymer or copolymer, and mixtures thereof; and
- 20 (d) water.
32. The composition of claim 31 further comprising up to about 10%, by weight, of a water-soluble organic solvent.
- 25 33. The composition of claim 31 or claim 32 further comprising one or more optional ingredient selected from the group consisting of a viscosity modifier, a dispersant, a pH modifier, a surfactant, and mixtures thereof.
- 30 34. The composition of one of the claims 31 to 33 wherein the colorant and the opacifying agent are present in a weight ratio of 1 part colorant to 0.5 to 3 parts opacifying agent.
- 35 35. The composition of one of the claims 31 to 34 wherein the opacifying agent and the superabsorbent polymer are present in a weight ratio of 1 part opacifying agent to 2 to 4 parts superabsorbent polymer.